TITLE 13. CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC HEARING TO CONSIDER AMENDMENTS TO ADOPT NOT-TO-EXCEED AND EURO III EUROPEAN STATIONARY CYCLE EMISSION TEST PROCEDURES FOR THE 2005 AND SUBSEQUENT MODEL YEAR HEAVY-DUTY DIESEL ENGINES

The Air Resources Board (Board or ARB) will conduct a public hearing at the time and place noted below to consider amendments to regulations to adopt supplemental test procedures for 2005 and subsequent model year heavy-duty diesel engines. The supplemental test procedures include the Not-to-Exceed and EURO III European Stationary Cycle emission test procedures.

DATE: December 7, 2000

TIME: 9:00 a.m.

PLACE: Air Resources Board
Board Hearing Room, Lower Level
2020 L Street
Sacramento, California

This item will be considered at a two-day meeting of the Board, which will commence at 9:00 a.m., December 7, 2000, and may continue at 8:30 a.m., December 8, 2000. This item may not be considered until December 8, 2000. Please consult the agenda for the meeting, which will be available at least 10 days before December 7, 2000, to determine the day on which this item will be considered.

This facility is accessible to persons with disabilities. If accommodation is needed, please contact the Clerk of the Board at (916) 322-5594 or TDD (916) 324-9531 or (800) 700-8326 for TDD calls from outside the Sacramento area by November 22, 2000.

INFORMATIVE DIGEST OF PROPOSED ACTION AND PLAIN ENGLISH POLICY STATEMENT OVERVIEW

Sections Affected: California Code of Regulations (CCR), title 13, article 1.5; section 1956.8; and section 2065, and the incorporated "California Exhaust Emission Standards And Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles."

In the 1990s, seven large manufacturers of heavy-duty diesel engines (HDDEs) violated certification regulations by turning off, or defeating, emissions control equipment during in-use highway driving. To address this violation, the Department of Justice, the United States Environmental Protection Agency (U.S. EPA) and the ARB signed consent decrees with the seven engine manufacturers. A consent decree is a judicial decree

that recognizes a mutual settlement between the parties — in this case, between the government and the engine manufacturers (herein referred to as the "settling manufacturers").

In the consent decrees, the settling manufacturers are required, among other things, to produce HDDEs that comply with prescribed emission standards that are lower than those required in current state and federal regulations, as measured by the Federal Test Procedure (FTP). Specifically, these engines must meet a 2.5 gram per brake horsepower (g/bhp-hr) hour standard for non-methane hydrocarbons (NMHC) plus oxides of nitrogen (NOx) emissions no later than October 1, 2002 (about 50 percent cleaner than current engines). In addition, because it was found that the FTP was not adequate to ensure that exhaust emissions were controlled during all in-use driving, it was agreed that compliance with supplemental test procedures would be necessary. Thus, the majority of the settling manufacturers agreed to produce engines by October 1, 2002, that would meet supplemental test procedures including the Not-To-Exceed (NTE) test and the EURO III European Stationary Cycle (ESC) test. The consent decree states that these requirements must be met for a period of two years. Together with the FTP test, the supplemental test procedures will require control of emissions during the majority of real world operating conditions, ensuring that in the future defeat devices will no longer be employed.

Recognizing the effectiveness of the supplemental tests, the U.S. EPA published a Notice of Proposed Rulemaking (Vol. 64, Federal Register, pp. 58472- 58566, October 29, 1999) proposing to adopt similar supplemental test procedures for 2004 and subsequent model year HDDEs. However, because of federal timing constraints, the NTE and ESC test procedures will not be required until the 2007 model year for federally certified HDDEs (65 FR 59896, October 6, 2000). Therefore, once the HDDE consent decree requirements expire in 2004, the settling manufacturers will not be obligated to comply with the supplemental test procedures in 2005 or 2006. Not until the 2007 model year, when the federal rule comes into effect, will HDDE manufacturers be required to comply with similar supplemental test procedures federally.

In order to assure continued compliance during model years 2005 and 2006 by the settling manufacturers and to begin compliance by all other manufacturers in 2005, staff proposes the inclusion of the NTE and ESC tests in the required California certification process for 2005 and subsequent model year HDDEs. The proposed supplemental test procedures are identical to those in the Consent Decrees. In addition, staff proposes the exemption of "ultra-small volume manufacturers"[1] and "urban buses"[2] from the proposed supplemental test procedures until the 2007 model year in order to allow additional lead time for compliance. Below is a summary of the proposed amendments:

[1] An "ultra-small volume manufacturer" is defined as any manufacturer with California sales less than or equal to 300 new passenger cars, light-duty trucks, medium-duty vehicles, heavy-duty vehicles, and heavy-duty engines per model year based on the average number of vehicles and engines sold by the manufacturer in the previous three consecutive model years.

[2] An "urban bus" is defined in proposed title 13, California Code of Regulations, section 1956.2.

1. Not-to-Exceed Test Procedure

The NTE test establishes an area (NTE control area) under the torque curve of an engine where emissions must not exceed a specified cap for a given pollutant. The NTE cap is set at 1.25 times the FTP emission limit. For 2005 model year heavy-duty engines, the FTP emission limit for NMHC plus NOx is 2.5 grams per brake horsepower-hour, and thus the NTE cap is 3.125 grams per brake horsepower-hour. As in the consent decree requirements, an additional 0.5 grams per brake horsepower-hour is proposed for determining compliance with the supplemental procedures in in-use compliance testing.

The basic NTE control area for diesel engines has three primary boundaries. The first is the upper boundary, which is represented by the engine's torque and speed map. This shows an engine's maximum torque at a given speed. The second boundary is 30 percent of maximum torque. Only operation above this boundary is included in the NTE control area. The third boundary is determined based on the lowest engine speed at 50 percent of maximum power and highest engine speed at 70 percent of maximum power. Only engine operation above the engine speed boundary is included in the NTE control area. Additionally, there are two small areas which are "carved out" of the basic NTE control area because of uncertain technical feasibility.

Notwithstanding the conditions outside the NTE control area specified above, the NTE requirement would apply under any engine operating conditions that could reasonably be expected in normal vehicle use. A vehicle can be tested for compliance with the NTE procedure either on the road or in emissions testing laboratory using an engine or chassis dynamometer. Instead of using a specific driving cycle such as the FTP, compliance testing can involve driving of any type which could reasonably be expected to occur in normal vehicle operation within the boundaries of the NTE control area, including operation under steady-state or transient conditions and under varying ambient conditions. Measured emissions are averaged over a minimum of thirty seconds and compared to the NTE test cap. These requirements would apply to new engines and throughout their useful life.

The NTE test procedures are applicable for a wide range of ambient conditions. For example, NTE ambient temperature coverage can range from 55 ^{o}F to 95 ^{o}F compared to the FTP ambient conditions of 68 ^{o}F to 86 ^{o}F. Two different options related to temperature and altitude will be available for manufacturers to comply with the NTE requirements. Under option one, manufacturers must comply with the NTE requirements within the ambient temperature range of 55 °F to 95 °F, and an altitude range of up to 5,500 feet above sea level. Within this NTE altitude and temperature zone, the engine must meet the NTE requirements. For testing at a given altitude outside of this zone, NOx and PM emission results may be corrected for temperature.

Under option two, manufacturers must comply with the NTE requirements between 55 °F and 100 °F at sea-level and between 55 °F and 86 °F at 5,500 feet above sea-level. The maximum temperatures for the corresponding altitudes between those points are determined linearly. At temperatures above the NTE zone, NTE requirements do not apply. Additionally, defeat devices may not be used in the temperatures above the NTE control area. This option is not contained in the consent decrees although it is in the U.S. EPA's Final Rule. It is provided here because it provides even better control of off-cycle emissions under typical California conditions.

In U.S. EPA's Final Rule, a NTE deficiency provision for 2007 through 2009 model year engines provides manufacturers with a relief mechanism for failing to comply with some of the NTE requirements. Because the NTE control area and test procedures in the proposed regulation are identical to the NTE requirements in the HDDE consent decree for model years 2003 and 2004, the settling manufacturers will be in compliance with proposed NTE requirements prior to the effective date of this proposal. However, it may be possible that manufacturers will have technical difficulties that are limited in nature. Therefore, staff proposes the inclusion of NTE deficiencies from 2005 through 2007 model years. This provision is optional and increases manufacturer flexibility compared to the consent decrees.

2. EURO III European Stationary Cycle Test Procedure

The Euro III ESC test cycle, or the "supplemental steady state test," consists of 13 modes at different speed and power conditions, primarily representing the typical highway cruise operating conditions of heavy-duty diesel vehicles.

During the test cycle, the engine is initially operated at idle, then through a defined sequence of 12 modes at various speeds and engine loads. The test modes are at three different operational engine speeds and at 25%, 50%, 75%, and 100% of maximum load. The engine is operated for two minutes at each mode, except for idle. The emission results at each mode are then weighted and averaged.

Manufacturers would be required to show compliance with the following:

Average Allowable Testing Caps

At each mode of operation of the ESC test, the concentration of the gaseous pollutants is measured. The weighted average emissions for each pollutant must not be greater than the existing FTP emission limit which is 2.5 grams per brakehorsepower-hour for NMHC plus NOx for 2005 and subsequent model year engines. A single, particulate matter measurement is made of the entire 13 modes at the end of the test. The ARB may select 3 additional test points between the 12 non-idle test

modes for gaseous pollutants only. The purpose of the additional tests is to ensure that the engine emission controls are not optimized for the specific test modes and then defeated when operating in modes not specified for testing.

Maximum Allowable Testing Caps

Maximum allowable emission caps are determined from the 12 non-idle test points of the ESC tests. The maximum allowable emission cap at any set of speed and load conditions between the test points can be determined by using a four-point interpolation procedure. Emissions of gaseous pollutants at any point within the maximum allowable emission capped operational zone must not exceed the emissions standard as determined by interpolation. Maximum allowable emission caps only apply to gaseous pollutants and do not apply to particulate matter.

3. Measuring Smoke Emissions Within the NTE Control Area

Within the NTE control area, an engine must meet either a filter smoke cap or an opacity cap. The filter smoke cap is 1.0 on the Bosch number scale, a measure of smoke opacity. There are two alternatives for the smoke opacity cap. The first opacity cap is 4 percent averaged over 30 seconds using a 5-inch path. This cap is for transient testing. The second opacity cap is also 4 percent, but averaged over 10 seconds using a 5-inch path. This cap is for steady state testing. Smoke emissions at these low levels would not be visible.

AVAILABILITY OF DOCUMENTS AND AGENCY CONTACT PERSON

The Board staff has prepared a Staff Report which includes the initial statement of reasons (ISOR) for the proposed action and a summary of the environmental impacts of the proposal. Copies of the Staff Report, and the full text of the proposed regulatory language may be obtained from the Board's Public Information Office, 2020 L Street, Sacramento, CA 95814, (916) 322-2990. The Board staff has compiled a record which includes all information upon which the proposal is based. This material is available for inspection upon request to the agency contact person identified immediately below.

The ARB staff has determined that it is not feasible to draft the regulation in plain English due to the technical nature of the regulation; however, a plain English summary of the regulation is available from the agency contact person named in this notice, and is also contained in the ISOR for this regulatory action.

To obtain the ISOR in an alternate format, please contact the Air Resources Board's ADA Coordinator at (916) 323-4916, TCC (916) 324-9531, or (800) 700-8326 for TDD calls from outside the Sacramento area. This notice, the ISOR, and subsequent regulatory documents will also be available on the ARB's Internet site for this rulemaking at: http://www.arb.ca.gov/regact/NTEtest/NTEtest.htm .

Further inquiries regarding this matter should be directed to the agency contact person for this rulemaking, Ms. Susan O'Connor, Manager, On-Road Heavy-Duty Diesel Section, at (626) 450-6162 of the Air Resources Board, Mobile Source Control Division, 9528 Telstar Avenue, El Monte, California 91731.

COSTS TO PUBLIC AGENCIES AND TO BUSINESSES AND PERSONS AFFECTED

The determinations of the Board's Executive Officer concerning the costs or savings necessarily incurred in reasonable compliance with the proposed regulations are presented below.

The Executive Officer has determined that the proposed regulatory action will not create costs or savings, as defined in Government Code section 11346.5(a)(6), to any state agency or in federal funding to the state, costs or mandate to any local agency or school district whether or not reimbursable by the state pursuant to part 7 (commencing with section 17500), division 4, title 2 of the Government Code, or other non-discretionary savings to local agencies.

The Executive Officer has also determined that adoption of the proposed regulatory action will not have a significant adverse economic impact on businesses, including the ability of California businesses to compete with businesses in other states, except as noted below.

The businesses affected by the proposed supplemental test procedures are the manufacturers of HDDEs sold in California. Based on previous sales data, there are 21 companies that manufacture these types of engines. The proposed test procedures may be expected to result in some engine design modifications, which in turn, may result in increased costs to the engine manufacturers. However, these costs are expected to be passed on to the consumers or purchasers of heavy-duty vehicles with a gross vehicle weight rating of 14,001 pounds and greater. Since the settling manufacturers, account for approximately 60 percent of heavy-duty diesel vehicle sales and are required to comply with identical requirements beginning two years prior to 2005, most purchasers are not expected to experience an increase in vehicle cost as a result of the proposed regulations.

If the entire costs are passed on to the consumer, heavy-duty vehicle retail prices would increase by a maximum of approximately $674 per medium heavy-duty vehicle and $824 per heavy heavy-duty vehicle in the 2005 model year. U.S. EPA estimates that average vehicle costs are $52,000 per medium heavy-duty vehicle and $108,000 per heavy heavy-duty vehicle. Based on U.S. EPA's estimated vehicle costs, the estimated

price increase would represent a 1-2 percent price increase. The price increase of this size is not expected to dampen the demand of heavy-duty vehicles. Consequently, the impact to dealers of heavy-duty vehicles is not expected to be significant. The expected price increase is also not expected to impact California employment, business expansion, creation and elimination, or the ability of California businesses to compete with businesses from other states.

Due to the additional emission control technologies that may be required, manufacturers of those technologies may experience higher sales volume. The higher sales volume may also increase employment for those businesses that supply parts between the related businesses. Compared to overall California employment, this effect is expected to be minor. Additionally, to the extent that manufacturers use contract laboratories located in California for testing or other research and development efforts, there is a potential increase in contract laboratory employment. No other associated businesses are expected to be affected by the proposed supplemental test procedures.

The estimated excess NOx emissions expected to be reduced due to the proposed supplemental test procedures is 8.4 tons per day in 2005 and 17.3 tons per day in 2006. This estimate is for California registered vehicles only. Based on the costs described above, the cost effectiveness is estimated to range from $0.63 to $0.09 per pound of excess NOx reduced. The range depends upon the weight class of the heavy-duty vehicle. Based on current sales distribution of the two weight classes, overall cost effectiveness is estimated at $0.17 per pound of excess NOx reduced. This is well within the range of cost-effectiveness determined by previous regulatory action within the past decade.

In accordance with Government Code section 11346.54, the Executive Officer has determined that the proposed regulatory action will not adversely affect the creation or elimination of jobs with the State of California, the creation of new businesses or elimination of existing businesses within California, or the expansion of businesses currently doing business within California. The Executive Officer has also determined, pursuant to Government Code section 11346.5(a)(3)(B), that the proposed regulatory action will affect small business. A full assessment of the economic impact of the proposed regulatory action can be found in the Staff Report.

The Executive Officer has considered proposed alternatives that would lessen any adverse economic impact on businesses and invites you to submit proposals. Submissions may include the following considerations:

(i) The establishment of differing compliance or reporting requirements or timetables which take into account the resources available to businesses.

(ii) Consolidation or simplification of compliance and reporting requirements for businesses.

(iii) The use of performance standards rather than prescriptive standards.

(iv) Exemption or partial exemption from the regulatory requirements for businesses.

Before taking final action on the proposed regulatory action, the Board must determine that no alternative considered by the agency would be more effective in carrying out the purpose for which the action is proposed or would be as effective and less burdensome to affected private persons than the proposed action.

SUBMITTAL OF COMMENTS

The public may present comments relating to this matter orally or in writing. To be considered by the Board, written submissions must be addressed to and received by the Clerk of the Board, Air Resources Board, P.O. Box 2815, Sacramento, CA 95812, no later than 12:00 noon, December 6, 2000, or received by the Clerk of the Board at the hearing. To be considered by the ARB, e-mail submissions must be addressed to NTEtest@listserve.arb.ca.gov and received at the ARB no later than 12:00 noon, December 6, 2000.

The Board requests but does not require that 30 copies of any written statement be submitted and that all written statements be filed at least 10 days prior to the hearing. The Board encourages members of the public to bring to the attention of staff in advance of the hearing any suggestions for modification of the proposed regulatory action.

STATUTORY AUTHORITY

This regulatory action is proposed under that authority granted in California Health and Safety Code sections 39600, 39601, 43013, 43018, 43101, 43104, 43105, 43210, and 43806, and Vehicle Code section 28114. This action is proposed to implement, interpret and make specific California Health and Safety Code sections 39002, 39003, 39500, 43000, 43012, 43013, 43018, 43100, 43101, 43101.5, 43102, 43104, 43106, 43202, 43203, 43204, 43210-43213, and 43806, and Vehicle Code section 28114.

HEARING PROCEDURES

The public hearing will be conducted in accordance with the California Administrative Procedure Act, title 2, division 3, part 1, chapter 3.5 (commencing with section 11340) of the Government Code.

Following the public hearing, the Board may adopt the regulatory language as originally proposed, or with non-substantial or grammatical modifications. The Board may also adopt the proposed regulatory language with other modifications if the text as modified is sufficiently related to the originally proposed text that the public was adequately placed on notice that the regulatory language as modified could result from the proposed regulatory action; in such event the full regulatory text, with the modifications

clearly indicated, will be made available to the public, for written comment, at least 15 days before it is adopted. The public may request a copy of the modified regulatory text from the Board's Public Information Office, 2020 L Street, Sacramento, CA 95814, (916) 322-2990.

CALIFORNIA AIR RESOURCES BOARD

Michael P. Kenny
Executive Officer

Date: October 10, 2000